

PATENT APPLICATION

Docket No. LAR50-001

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:		)	
	Steven S. Larsen	)	
Application No.:	10/690,421	)	Art Unit
Confirmation No.:	3835	)	3732
Filed:	10/20/2003	)	
For:	Endodontic instrument	)	
Examiner:	Lewis, Ralph A.	)	

**PETITION TO REVIVE ABANDONED APPLICATION**  
**UNDER 37 C.F.R. §1.137(b)**

Mail Stop Petition  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
Attn: Office of Petitions

Sir/Madam:

**Statement of unintentional failure to file a continuation in part application.**

This application was filed on October 20, 2003, and after prosecution and appeal, became abandoned on November 17, 2011. Applicant now respectfully requests revival of the application in order to file a continuation-in-part application, which is submitted herewith as Exhibit A, concurrent with filing (Application No. 13/444,367; Confirmation No. 4938), and along with corresponding fees.

By way of background, this is Applicant's first patent application. The underlying product is the foundation of a family business involving Applicant's children and they depend on it for their support. Applicant has acted diligently throughout, but has relied on former patent counsel for information regarding status and strategy.

Applicant has not been accurately informed of either status or strategy from former counsel. For example, Applicant did not know that former counsel obtained lengthy extension periods and passed on the accompanying fees. Applicant did not timely know of options relating to a request for continued examination (RCE) or continuation applications prior to abandonment.

On April 2, 2012, Applicant hired undersigned counsel to review the application. Applicant became informed that the application was abandoned. Applicant did not intend that the application become abandoned. The abandonment was unintentional.

Applicant has expended time and resources towards preparation of an expedited continuation-in-part (CIP) application, which he now wishes to file. The CIP is prepared with the intent of overcoming all former objections and rejections by the examiner and appeals board, and to correct what Applicant perceives as deficiencies in the original application occasioned by former counsel.

A declaration from the Applicant on this subject is included herewith. From November 17, 2011 to April 2, 2012, the abandonment was unintentional because Applicant was not aware of either status or options. From April 2, 2012 to the time of this filing, undersigned counsel has actively worked with Applicant to review the file and draft this petition and the reply. The entire delay in filing this required reply from the due date for the reply until the filing of a grantable petition pursuant to 37 CFR 1.137(b) was unintentional.

On behalf of Applicant, the undersigned respectfully and sincerely requests that the application be revived to allow for the filing and examination of the CIP.

Dated this 10<sup>th</sup> day of April, 2012.

Respectfully submitted,

/Preston P. Frischknecht/  
Preston P. Frischknecht  
Attorney for Applicant  
Registration No. 61,312  
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Exhibit A

## Electronic Acknowledgement Receipt

<b>EFS ID:</b>	12519182
<b>Application Number:</b>	13444367
<b>International Application Number:</b>	
<b>Confirmation Number:</b>	4938
<b>Title of Invention:</b>	Endodontic Instrument
<b>First Named Inventor/Applicant Name:</b>	Steven S. Larsen
<b>Customer Number:</b>	62733
<b>Filer:</b>	Preston Paul Frischknecht/Heidi Dryden
<b>Filer Authorized By:</b>	Preston Paul Frischknecht
<b>Attorney Docket Number:</b>	LAR50-001
<b>Receipt Date:</b>	11-APR-2012
<b>Filing Date:</b>	
<b>Time Stamp:</b>	15:56:55
<b>Application Type:</b>	Utility under 35 USC 111(a)

### Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$620
RAM confirmation Number	2647
Deposit Account	
Authorized User	

### File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
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1	Application Data Sheet	1ADS.pdf	1023112	no	4
			1448796382c9e874d9fe241b0baa080db991b63d		
Warnings:					
Information:					
2	Specification	2Spec.pdf	98390	no	7
			74bc5ceec77ba046fcb07d65dd2ebab7f8b762df		
Warnings:					
Information:					
3	Claims	3Claims.pdf	89644	no	5
			0af70d4ae2165c5b7342476892543bab345f8a8c		
Warnings:					
Information:					
4	Abstract	4Abstract.pdf	76197	no	1
			d2006286d77afdde8d7fed680860d67ceeb4a5ca		
Warnings:					
Information:					
5	Oath or Declaration filed	6SgndODCIP.pdf	174608	no	4
			8bfd6efc16afba6f4ef5ab7be0e36758900f4c8		
Warnings:					
Information:					
6	Power of Attorney	7SgndPOACIP.pdf	97617	no	2
			1696a324ebf4d0d9248804cd67f3dd6cdae753b3		
Warnings:					
Information:					
7	Drawings-only black and white line drawings	5Fig1-5.pdf	61173	no	4
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Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	36007	no	2
			aa0a897d8a18313905217754ca8bc1b5138baa97		
Warnings:					
Information:					
Total Files Size (in bytes):			1656748		

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**New Applications Under 35 U.S.C. 111**

**If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.**

**National Stage of an International Application under 35 U.S.C. 371**

**If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.**

**New International Application Filed with the USPTO as a Receiving Office**

**If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.**

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	LAR50-001
		Application Number	
Title of Invention	Endodontic Instrument		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

## Secrecy Order 37 CFR 5.2

- ☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

## Applicant Information:

<b>Applicant 1</b>					
<b>Applicant Authority</b>		<input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117	
				<input type="radio"/> Party of Interest under 35 U.S.C. 118	
<b>Prefix</b>	<b>Given Name</b>	<b>Middle Name</b>	<b>Family Name</b>	<b>Suffix</b>	
Dr.	Steven		Larsen		
<b>Residence Information (Select One)</b> <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service					
<b>City</b>	North Logan	<b>State/Province</b>	UT	<b>Country of Residence</b>	US
<b>Citizenship under 37 CFR 1.41(b)</b>		US			
<b>Mailing Address of Applicant:</b>					
<b>Address 1</b>		150 East 200 North, Ste. G			
<b>Address 2</b>		Professional Plaza			
<b>City</b>	Logan	<b>State/Province</b>	UT		
<b>Postal Code</b>	84321	<b>Country</b>	US		
All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the <b>Add</b> button.					

## Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a).			
<input type="checkbox"/> An Address is being provided for the correspondence information of this application.			
<b>Customer Number</b>	62733		
<b>Email Address</b>		<input type="button" value="Add Email"/>	<input type="button" value="Remove Email"/>

## Application Information:

<b>Title of the Invention</b>	Endodontic Instrument		
<b>Attorney Docket Number</b>	LAR50-001	<b>Small Entity Status Claimed</b> <input checked="" type="checkbox"/>	
<b>Application Type</b>	Nonprovisional		
<b>Subject Matter</b>	Utility		
<b>Suggested Class (if any)</b>		<b>Sub Class (if any)</b>	
<b>Suggested Technology Center (if any)</b>			
<b>Total Number of Drawing Sheets (if any)</b>	4	<b>Suggested Figure for Publication (if any)</b>	

<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	LAR50-001
		Application Number	
Title of Invention	Endodontic Instrument		

**Publication Information:**

<input type="checkbox"/>	Request Early Publication (Fee required at time of Request 37 CFR 1.219)
<input type="checkbox"/>	<b>Request Not to Publish.</b> I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application <b>has not and will not</b> be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

**Representative Information:**

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing.			
Please Select One:	<input checked="" type="radio"/> Customer Number	<input type="radio"/> US Patent Practitioner	<input type="radio"/> Limited Recognition (37 CFR 11.9)
Customer Number	62733		

**Domestic Benefit/National Stage Information:**

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification.			
Prior Application Status	Abandoned	<a href="#">Remove</a>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation in part of	10690421	2003-10-20
Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the <b>Add</b> button.			

**Foreign Priority Information:**

This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a).			
			<a href="#">Remove</a>
Application Number	Country <sup>i</sup>	Parent Filing Date (YYYY-MM-DD)	Priority Claimed
			<input checked="" type="radio"/> Yes <input type="radio"/> No
Additional Foreign Priority Data may be generated within this form by selecting the <b>Add</b> button.			

**Assignee Information:**

Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office.	
<b>Assignee 1</b>	



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<b>Application Data Sheet 37 CFR 1.76</b>		Attorney Docket Number	LAR50-001
		Application Number	
Title of Invention	Endodontic Instrument		

If the Assignee is an Organization check here. <input type="checkbox"/>				
Prefix	Given Name	Middle Name	Family Name	Suffix
<b>Mailing Address Information:</b>				
Address 1				
Address 2				
City		State/Province		
Country		Postal Code		
Phone Number		Fax Number		
Email Address				
Additional Assignee Data may be generated within this form by selecting the <b>Add</b> button.				

**Signature:**

A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.					
<b>Signature</b>	/Preston P. Frischknecht/			Date (YYYY-MM-DD)	2012-11-04
First Name	Preston	Last Name	Frischknecht	Registration Number	61312

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

**UNITED STATES PATENT APPLICATION**  
**of**  
**STEVEN S. LARSEN**  
**A Citizen of the United States**  
**1411 East 2100 North**  
**NORTH LOGAN, UTAH 84341**  
**for an**  
**ENDODONTIC INSTRUMENT**

**TITLE**

Endodontic Instrument

**CROSS-REFERENCE TO RELATED APPLICATIONS**

- 5 [0001] This application is a continuation in part of, and claims priority to, U.S. Application No. 10/690,421, Publication No. US 2005-0084818 A1.

**TECHNICAL FIELD OF THE INVENTION**

[0002] This invention relates to endodontic tools, especially a holder for an endodontic file.

10 **BACKGROUND OF THE INVENTION**

[0003] In order to preserve a tooth that has diseased pulp material therein, it is necessary to prevent bacterial proliferation within the pulp canal of the tooth by removing the diseased or necrotic pulp material from the pulp cavity or root canal. After pulp material has been removed or extirpated from a tooth, the pulp cavity or root canal is typically filled or obturated with an inert material in order to prevent future infection of the tooth root. This procedure is referred to as root canal therapy.

[0004] During root canal therapy, it is essential that the entire root canal be cleaned and filled to eliminate all organic matter contained within the root canal. The typical method for root canal therapy is to open the tooth to the pulp chamber and then find each canal orifice opening and work a small endodontic file down to the root end of the tooth. This small file is worked up and down the canal to create a smooth path, clear pulp tissue debris, and start the canal preparation. This initial root preparation is critical to the success of the treatment. This initial preparation of the canal serves as a “glide path” or “pilot hole” for all the other manual or mechanical instruments with files or bits to enlarge this initial preparation of the root canal to a finish prepared shape.

[0005] The root canal system of a human tooth is often narrow, curved, and calcified. It can be extremely difficult to negotiate or clean. Posterior teeth, molars, and premolars can be even more difficult to treat because of the limited room or space in which to operate. The mechanical manipulation the endodontic files in cleaning out the canals in this small limited space can become tedious in preparing the proper “glide path” preparation.

**[0006]** Conventional dental instruments used during root canal therapy—such as various endodontic file instruments—generally include a thin, flexible, metal shaft or file with an abrasive surface or sharp edges, which enables efficient cleaning of the root canal. A small, elongated plastic grip handle or hub end is attached at one end of the file instrument and is conventionally adapted for gripping by the dentist with the thumb and index finger in a “two-finger” grip.

**[0007]** The small, elongated plastic grip of these files mostly have a common dimensional hour glass shape. Most dental manufactures have maintained the uniformity of these grips which are standard in clinical endodontic instruments.

**[0008]** The “two-finger” grip is mostly unique in dentistry for holding the endodontic file instrument. Almost all other working operative instruments in dentistry are held by a long handle in a full hand pencil grip or “pen-grasp-grip.” For example the dental mirror, dental explorer, scaler, periodontal probe, material placing instrument, and others all have long handles which the dentist uses in the “pen-grasp-grip” or pencil grip.

**[0009]** Of additional interest is the fact that all of these dental tools mentioned have built into their design a “dental angle”. This “dental angle” allows better access and visibility to the tooth surfaces being examined, when cavities are filled, or teeth are being cleaned. For example: the dental mirror is angled for better access to see the various surfaces of the teeth, especially the posterior teeth. The dental explorer, scaler, periodontal probe, and material placing instrument all use the “dental angle” for the same reason, better access and better visibility in operating the instrument.

**[0010]** On the other hand, the conventional “two-finger” grip on the small handle of an endodontic file does not lend itself to having a built-in “dental angle.” The file is held by the dentist in a vertical straight line position to operate. With the files measuring 25 to 35 millimeters in length, the placement of these files into the canal and the working of these files with the conventional “two-finger” grip can be tedious and time consuming. Accessing molar and premolar teeth can be difficult most cases.

**[0011]** Visibility to see the canal orifice so as to place the file is also very difficult when holding the file in the conventional file grip. The dentist’s fingers holding the file, obstruct the view into the pulp chamber and the small orifice of the canal into which the file is to be placed.

[0012] The problems with the conventional manner of gripping an endodontic file in root canal therapy, especially in molars and premolars are numerous. With the limited space to do the root canal procedure, the “two-finger” endodontic file grip hinders the visibility to find the canals. The dentist’s fingers holding the file obstruct the field of view to the canals. It is difficult access and treat these cases with the conventional grip on the file.

[0013] Molar and premolar teeth usually require multiple filing motions even a hundred or more cycles of motion in preparing the initial “glide path.” The filing manipulation in molar and premolar teeth can be very tedious and tiring to the dentist and the patient. The dentist fingers have to be positioned over the tooth to work the file in the canal. Many times in treating molars and premolar it requires the patient to stretch open as wide as possible for quite some time.

[0014] Accordingly, there is a need for an improved endodontic device that overcomes or avoids the above problems, among many others. Holding the standard endodontic file in a pen-grasp-grip or pencil grip gives the dentist secure control of the file. An unsecured or slippery file grip can lead to error and injury.

#### **BRIEF SUMMARY OF THE INVENTION**

[0015] Therefore, an innovative endodontic instrument is provided which comprises, among other features: a handle having an elongated base with a threaded projection at a first end, the projection having a recessed distal surface capable of cupping a first terminus portion of an elongated plastic grip attached to an endodontic file; and a cap containing a channel extending through a first end of said cap with a first portion of the channel being threaded for mating with the projection of the elongated base of said endodontic instrument handle, said cap possessing a side, and said cap also having a second end containing an aperture through which an endodontic file can project, the diameter of the aperture being selected to be larger than the diameter of the endodontic file but smaller than the diameter of a plastic grip attached to the endodontic file, said cap further having a recessed interior surface capable of cupping a second terminus portion of an elongated plastic grip attached to an endodontic file. This instrument helps prevent the problems noted above, including awkward access angles and unsecured or slippery file grip that can lead to loss of control of the endodontic file during the root canal procedure and the possibility of swallowing or inhalation of the uncontrolled endodontic file leading to serious injury.

## BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0016] FIG. 1 is a side view of an endodontic file in one embodiment of the invention.

[0017] FIG. 2 is a side view of the handle and cap in one embodiment of the invention.

[0018] FIG. 3 is a cross-section, exploded view of the handle, endodontic file, and cap in one embodiment of the invention.

[0019] FIG. 4 is a cross-section of the handle, endodontic file, and cap in one embodiment of the invention.

[0020] FIG. 5 is a perspective view of one embodiment of the invention.

## DETAILED DESCRIPTION OF THE INVENTION

[0021] Referring now to Figure 1, an endodontic file **101** is a small, tapered, fluted wire with a tip **102** and to which may be attached an elongated plastic grip **103** with a first terminus portion **104** and a second terminus portion **105**. The file **101** is used in preparing and cleaning the root canal of a tooth. In various embodiments, the first and second terminus portions **104**, **105** of the elongated plastic grip **103** may have distally curving surfaces and/or partially rounded ends.

[0022] Referring now to Figure 2, the present holder **200** has a handle **201** and a cap **202**.

[0023] The handle **201** employs an elongated base **203** having a threaded projection **204** at a first end **205**. In various embodiments, the handle **201** has a plurality of longitudinally oriented recessed grooves **211** adjacent to the first end **205** of the elongated base **203** for increasing the handle's grip surface area and for providing rotational control of the instrument when in use. In still other embodiments, the handle has a plurality of transversely oriented recessed grooves **213** on the elongated base **203** for increasing the handle's grip surface area and for reducing longitudinal slippage when in use. Such transversely oriented recessed grooves **213** may be shallower and greater in number than the longitudinally oriented recessed grooves **211**.

[0024] Preferably, the maximum outer diameter of the cap **202** is substantially the same as the maximum outer diameter of the elongated base **203**.

[0025] The cap **202** contains a channel **206** extending through a first end **207** of the cap. The first portion **208** of the channel **206** is threaded (not shown) for mating with the projection **204** of the elongated base **203**. The second end **209** of the cap **202** contains an aperture **210** through which an endodontic file **101** can project. In various embodiments, the cap **202** also has a plurality of longitudinally oriented recessed grooves **214** adjacent to the first end **207** of the cap

**202** for increasing the cap's grip surface area and for providing rotational control when in use. In still other embodiments, the cap has a plurality of transversely oriented recessed grooves **215** for increasing the cap's grip surface area and for reducing longitudinal slippage when in use. Such transversely oriented recessed grooves **215** may be shallower and greater in number than the longitudinally oriented recessed grooves **214**.

[0026] Referring now to the cross-section of Figure 3, in various embodiments the threaded projection **204** and cap **202** have surfaces uniquely tailored, partially, and/or substantially complimentary to the distally curving surfaces and/or partially rounded ends of the elongated plastic grip **103** attached to an endodontic file **101**. Specifically, the projection **205** of the elongated base **204** may have a recessed distal surface **301** capable of cupping a first terminus portion **104** of an elongated plastic grip **103** attached to an endodontic file **101**. Likewise, the cap **202** may have a recessed interior surface **302**, located within the channel **206**, and capable of cupping a second terminus portion **105** of an elongated plastic grip **103** attached to an endodontic file **101**.

[0027] Referring now to the cross-section of Figure 4, in use, an endodontic file **101** is placed so that it extends through the aperture **210** with the elongated plastic grip **103** that is attached to the endodontic file **101** (at an end **106** opposite to the tip **102**) being in the channel **206**. (The diameter of the aperture **210** is selected to be larger than the diameter of the endodontic file **101** but smaller than the diameter of the elongated plastic grip **103**.) The cap **202** is then screwed closer to the first end **205** of the elongated base **203** until the elongated plastic grip **103** is securely retained in the channel **206** between the second end **209** of the cap **202** and the projection **204**, as a result of the recessed distal surface of the projection **301** cupping the first terminus portion **104** of the plastic grip **103** and the recessed interior surface **302** of the cap **202** cupping the second terminus portion **105** of the plastic grip **103** through a compression fit achieved from the mating of the elongated base **203** and cap **202**.

[0028] As a result of this configuration, including the surfaces **301** and **302** of the threaded projection **204** and cap **202** being uniquely tailored, partially, and/or substantially complimentary to the distally curving surfaces and/or partially rounded ends of the elongated plastic grip attached to an endodontic file, the elongated plastic grip **103** is securely maintained by maximizing surface area contact between parts during the mating of the elongated base **203** and cap **202** and consequent compression fit. Indeed, when so securely maintained, the tip of the



endodontic file **102** is not capable of being variably positioned within the instrument along the Y axis due to the compression fit.

[0029] Referring now to Figure 5, a closer perspective view of the elongated plastic grip **103** within the channel illustrates the manner of fitting and structure within one embodiment of the invention.

[0030] In order to facilitate the work of an endodontist, an option to the present invention is, as portrayed in Figure 4, an endodontic file **101** that initially moves away from the centerline of the endodontic file **101** in a first direction shown by the arrow A and then curves back toward and crosses the centerline as the tip **102** of the endodontic file **101** is approached but does not then again cross the centerline.

[0031] Referring back to Figure 2, in order to accommodate such a bent endodontic file **101**, the aperture **210** is extended to the side **216** of the cap **202** and, on such side **216**, enlarged to dimensions sufficient to permit the introduction into the channel **206** of the elongated plastic grip **103**.

[0032] The instrument aids the dentist by changing the thumb-and-finger grip to a secure pencil-type grip, which is more suitable for manipulating the endodontic file **101**. And the bent endodontic file **101** permits the dentist to place his or her hand in a more convenient location.

[0033] As used herein, the term "substantially" indicates that one skilled in the art would consider the value modified by such terms to be within acceptable limits for the stated value.

Also as used herein the term "preferable" or "preferably" means that a specified element or technique is more acceptable than another but not that such specified element or technique is a necessity.

[0034] The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

## CLAIMS

1. An endodontic instrument, which comprises:

a handle having an elongated base with a threaded projection at a first end, the projection having a recessed distal surface capable of cupping a first terminus portion of an elongated plastic grip attached to an endodontic file; and

a cap containing a channel extending through a first end of said cap with a first portion of the channel being threaded for mating with the projection of the elongated base of said endodontic instrument handle, said cap possessing a side, and said cap also having a second end containing an aperture through which an endodontic file can project, the diameter of the aperture being selected to be larger than the diameter of the endodontic file but smaller than the diameter of a plastic grip attached to the endodontic file, said cap further having a recessed interior surface capable of cupping a second terminus portion of an elongated plastic grip attached to an endodontic file.

2. The endodontic instrument as recited in claim 1, wherein:

the elongated base has a maximum outer diameter;

said cap has a maximum outer diameter; and

the maximum outer diameter of said cap is substantially the same as the maximum outer diameter of the elongated base.

3. The endodontic instrument as recited in claim 1, further comprising:

an endodontic file with a tip and also with an elongated plastic grip having first and second terminus portions, said grip attached to said endodontic file at an end opposite to the tip, said endodontic file extending through the aperture in the second end of said cap and the attached plastic grip being contained within the channel of said cap so that the recessed distal surface of the projection cups the first terminus portion of the plastic grip and the recessed interior surface of the cap cups the second terminus portion of the plastic grip through a compression fit achieved from the threaded mating of the elongated base and cap.

4. The endodontic instrument as recited in claim 3, wherein:

the elongated base has a maximum outer diameter;

said cap has a maximum outer diameter; and

the maximum outer diameter of said cap is substantially the same as the maximum outer diameter of the elongated base.

5. The endodontic instrument of claim 3, wherein the first and second terminus portions of the elongated plastic grip have distally curving surfaces.
6. The endodontic instrument of claim 3, wherein the first and second terminus portions of the elongated plastic grip have partially rounded ends.
- 5 7. The endodontic instrument of claim 1, wherein the tip of the endodontic file is not capable of being variably positioned within the instrument along the Y axis through a compression fit.
8. The endodontic instrument as recited in claim 1, wherein:  
the aperture in the second end of said cap extends to the side of said cap and, on such side, is  
10 enlarged to dimensions sufficient to permit the introduction in the channel of the plastic grip attached to the endodontic file.
9. The endodontic instrument as recited in claim 8, wherein:  
the elongated base has a maximum outer diameter;  
said cap has a maximum outer diameter; and  
15 the maximum outer diameter of said cap is substantially the same as the maximum outer diameter of the elongated base.
10. The endodontic instrument as recited in claim 1, the handle further having a plurality of longitudinally oriented recessed grooves adjacent to the first end of the elongated base for increasing the handle's surface area.
- 20 11. The endodontic instrument as recited in claim 1, the cap further having a plurality of longitudinally oriented recessed grooves for increasing the cap's surface area.
12. The endodontic instrument as recited in claim 10, the handle further having a plurality of transversely oriented recessed grooves on the elongated base for increasing the handle's surface area, said transversely oriented grooves being shallower and greater in number than the  
25 longitudinally oriented recessed grooves.
13. An endodontic instrument, which comprises:  
a handle having an elongated base with a threaded projection at a first end and a maximum outer diameter, the projection further having a recessed distal surface capable of cupping a first terminus portion of a plastic grip attached to an endodontic file;  
30 a cap having a maximum outer diameter substantially the same as the maximum outer diameter of the elongated base and containing a channel extending through a first end of said cap

with a first portion of the channel being threaded for mating with the projection of the elongated base of said endodontic instrument handle, said cap possessing a side, and said cap also having a second end containing an aperture through which an endodontic file can project, the diameter of the aperture being selected to be larger than the diameter of the endodontic file but smaller than the diameter of an elongated plastic handle attached to an endodontic file, the aperture extending to the side of said cap and, on such side, is enlarged to dimensions sufficient to permit the introduction in the channel of an elongated plastic grip attached to an endodontic file, said cap further having a recessed interior surface capable of cupping a first terminus portion of an elongated plastic grip attached to an endodontic file; and

an endodontic file with a tip and also with an elongated plastic grip having first and second terminus portions, said grip attached to said endodontic file at an end opposite to the tip, said endodontic file extending through the aperture in the second end of said cap and the attached plastic grip being contained within the channel of said cap so that the recessed distal surface of the projection cups the first terminus portion of the elongated plastic grip and the recessed interior surface of the cap cups the second terminus portion of the elongated plastic grip through a compression fit achieved from the threaded mating of the elongated base and cap.

14. The endodontic instrument as recited in claim 13, the handle further having a plurality of longitudinally oriented recessed grooves adjacent to the first end of the elongated base for increasing the handle's grip surface area and for providing rotational control of the instrument when in use.

15. The endodontic instrument as recited in claim 13, the cap further having a plurality of longitudinally oriented recessed grooves for increasing the cap's grip surface area and for providing rotational control of the instrument when in use.

16. The endodontic instrument as recited in claim 13, the handle further having a plurality of transversely oriented recessed grooves on the elongated base for increasing the handle's grip surface area and for reducing longitudinal slippage, said transversely oriented grooves being shallower and greater in number than the longitudinally oriented recessed grooves.

17. The endodontic instrument of claim 13, wherein the tip of the endodontic file is not capable of being variably positioned within the instrument along the Y axis through a compression fit.

18. The endodontic instrument of claim 13 wherein the first and second terminus portions of the elongated plastic grip have distally curving surfaces.

19. The endodontic instrument of claim 13 wherein the first and second terminus portions of the elongated grip have partially rounded ends.

5 20. An endodontic instrument, which comprises:

a handle having an elongated base with a threaded projection at a first end and a maximum outer diameter, the handle further having a plurality of longitudinally oriented recessed grooves adjacent to the first end of the elongated base for increasing grip surface area on the instrument, the handle further having a plurality of transversely oriented recessed grooves on the elongated base for increasing grip surface on the elongated base, said transversely oriented grooves being shallower and greater in number than the longitudinally oriented recessed grooves, and the projection having a recessed distal surface capable of cupping a first terminus portion of a plastic grip attached to an endodontic file;

15 a cap having a maximum outer diameter substantially the same as the maximum outer diameter of the elongated base and containing a channel extending through a first end of said cap with a first portion of the channel being threaded for mating with the projection of the elongated base of said endodontic instrument handle, said cap possessing a side, and said cap also having a second end containing an aperture through which an endodontic file can project, the diameter of the aperture being selected to be larger than the diameter of the endodontic file but smaller than the diameter of an elongated plastic grip attached to the endodontic file, the aperture extending to the side of said cap and, on such side, is enlarged to dimensions sufficient to permit the introduction in the channel of an elongated plastic grip attached to an endodontic file, said cap further having a recessed interior surface capable of cupping a second terminus portion of an elongated plastic grip attached to an endodontic file, said cap further having a plurality of longitudinally oriented recessed grooves for increasing the cap's grip surface area and for providing rotational control of the instrument when in use, said cap further having a plurality of transversely oriented recess grooves for increasing the caps grip surface area and for reducing longitudinal slippage when in use, said transversely oriented grooves being shallower and greater in number than the longitudinally oriented recessed grooves; and

25 30 an endodontic file with a tip and also with an elongated plastic grip having first and second terminus portions, said grip attached to said endodontic file at an end opposite to the tip,

said endodontic file extending through the aperture in the second end of said cap and the attached plastic grip being contained within the channel of said cap so that the recessed distal surface of the projection cups the first terminus portion of the plastic grip and the recessed interior surface of the cap cups the second terminus portion of the plastic grip through a compression fit achieved from the threaded mating of the elongated base and cap.

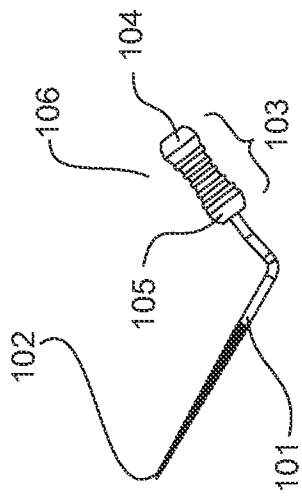
21. The endodontic instrument of claim 20, wherein the tip of the endodontic file is not capable of being variably positioned within the instrument along the Y axis through a compression fit.

22. The endodontic instrument of claim 20 wherein the first and second terminus portions of the elongated plastic grip have distally curving surfaces.

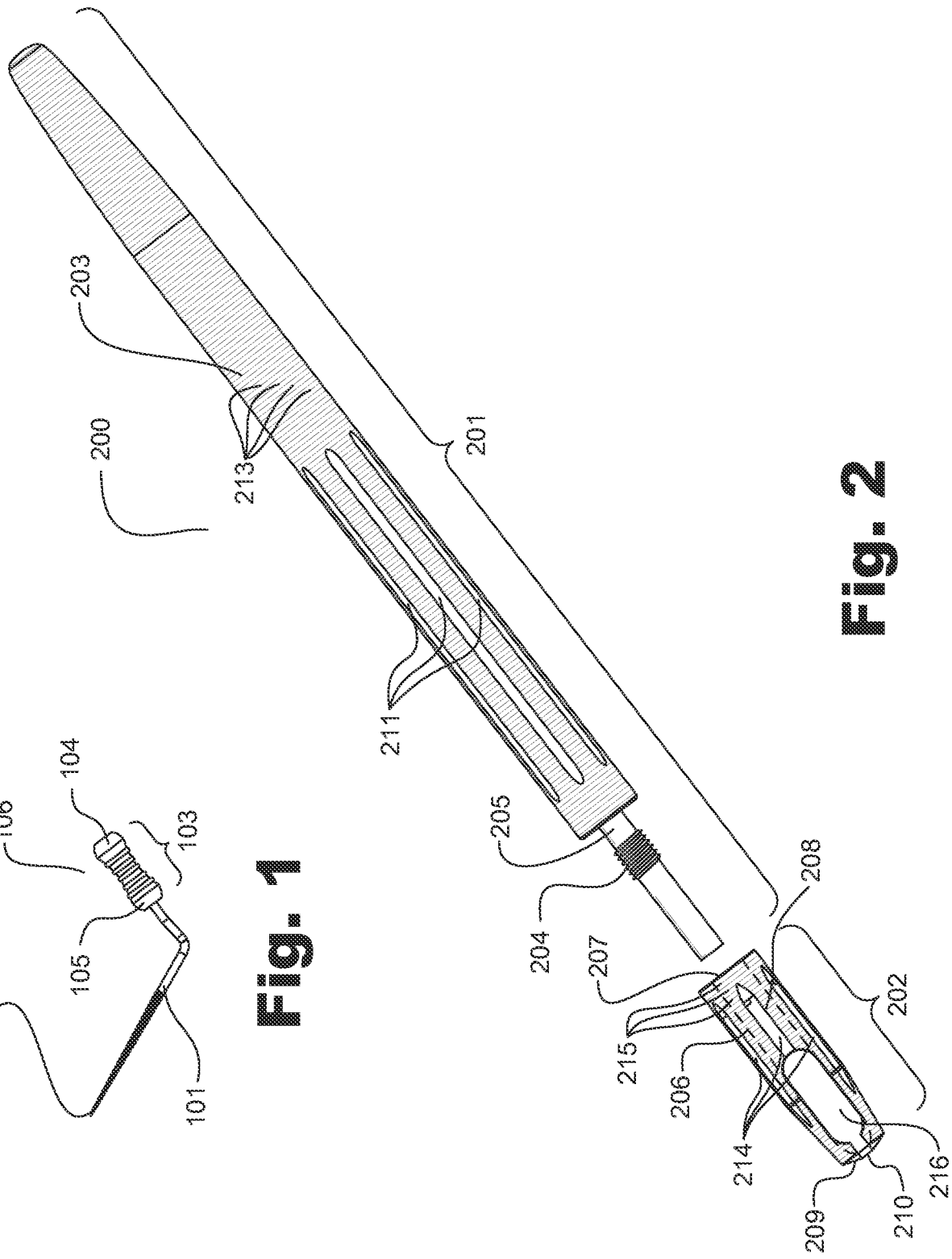
23. The endodontic instrument of claim 20 wherein the first and second terminus portions of the elongated grip have partially rounded ends.

**ABSTRACT**

The invention is an endodontic instrument which comprises, among other features: a handle having an elongated base with a threaded projection at a first end, the projection having a recessed distal surface capable of cupping a first terminus portion of an elongated plastic grip attached to an endodontic file; and a cap containing a channel extending through a first end of said cap with a first portion of the channel being threaded for mating with the projection of the elongated base of said endodontic instrument handle, said cap possessing a side, and said cap also having a second end containing an aperture through which an endodontic file can project, the diameter of the aperture being selected to be larger than the diameter of the endodontic file but smaller than the diameter of a plastic grip attached to the endodontic file, said cap further having a recessed interior surface capable of cupping a second terminus portion of an elongated plastic grip attached to an endodontic file. This instrument helps prevent the problems noted above, including awkward access angles and unsecured or slippery file grip that can lead to that can lead to loss of control of the endodontic file during the root canal procedure and the possibility of swallowing or inhalation of the uncontrolled endodontic file leading to serious injury.

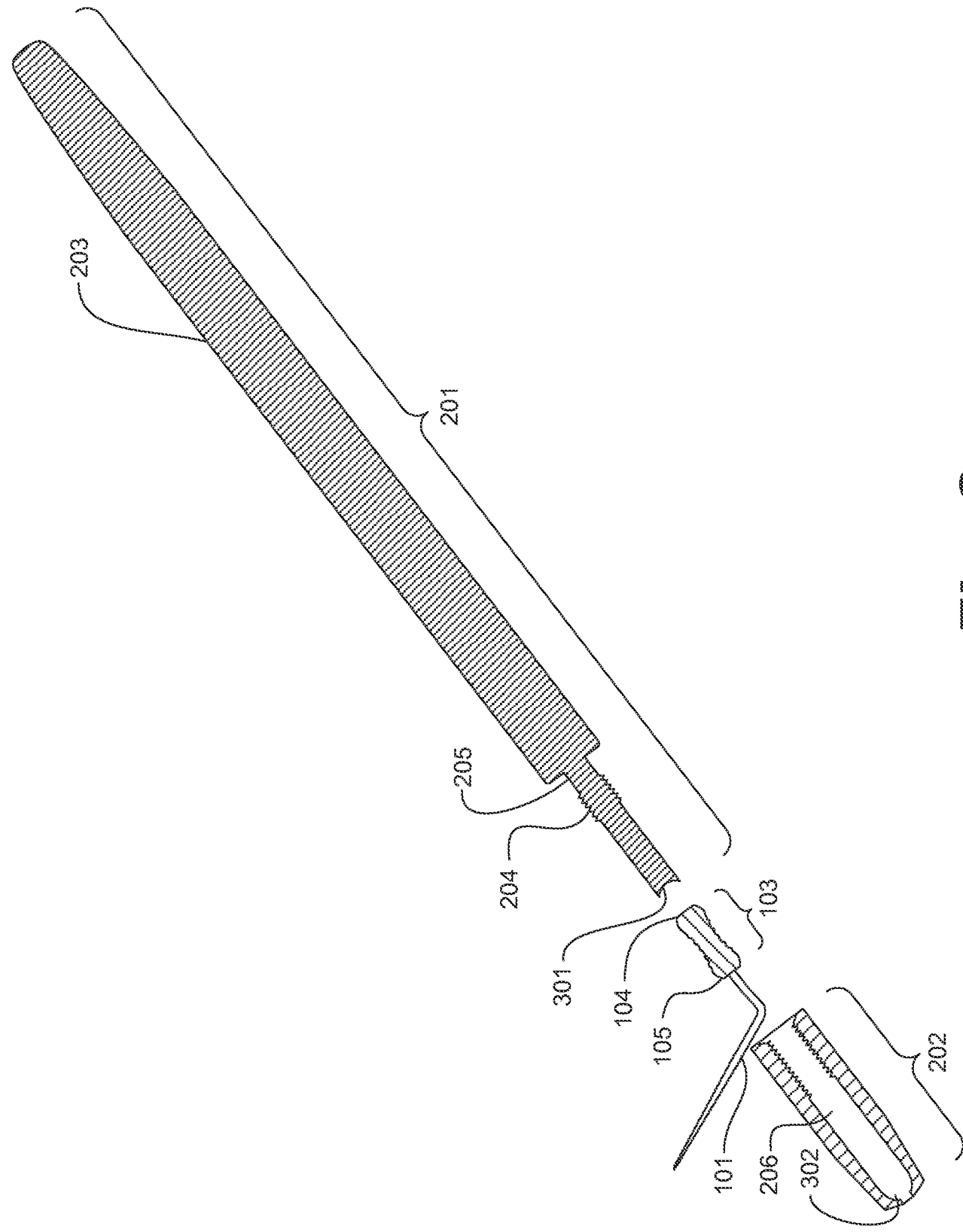


**Fig. 1**

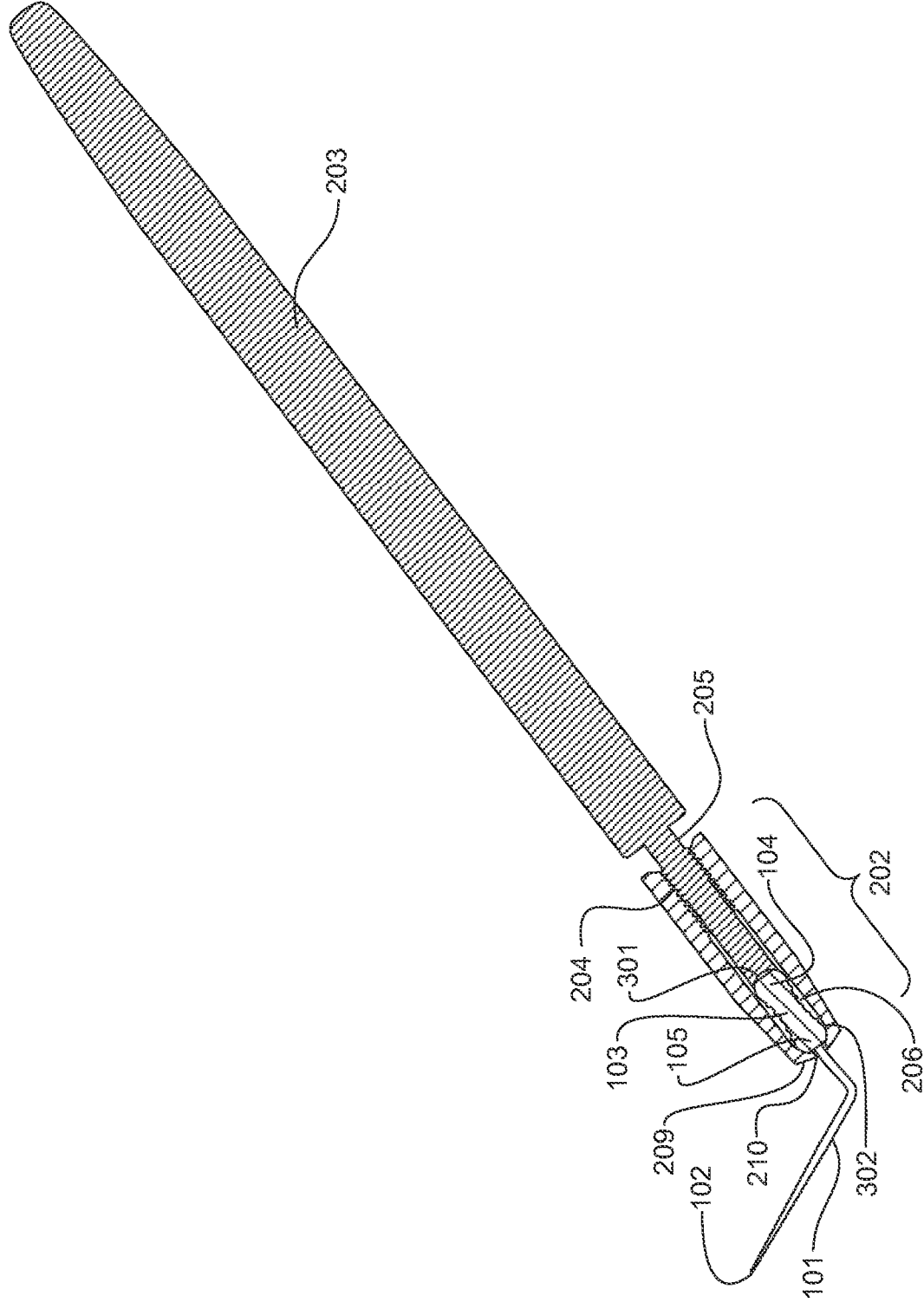


**Fig. 2**

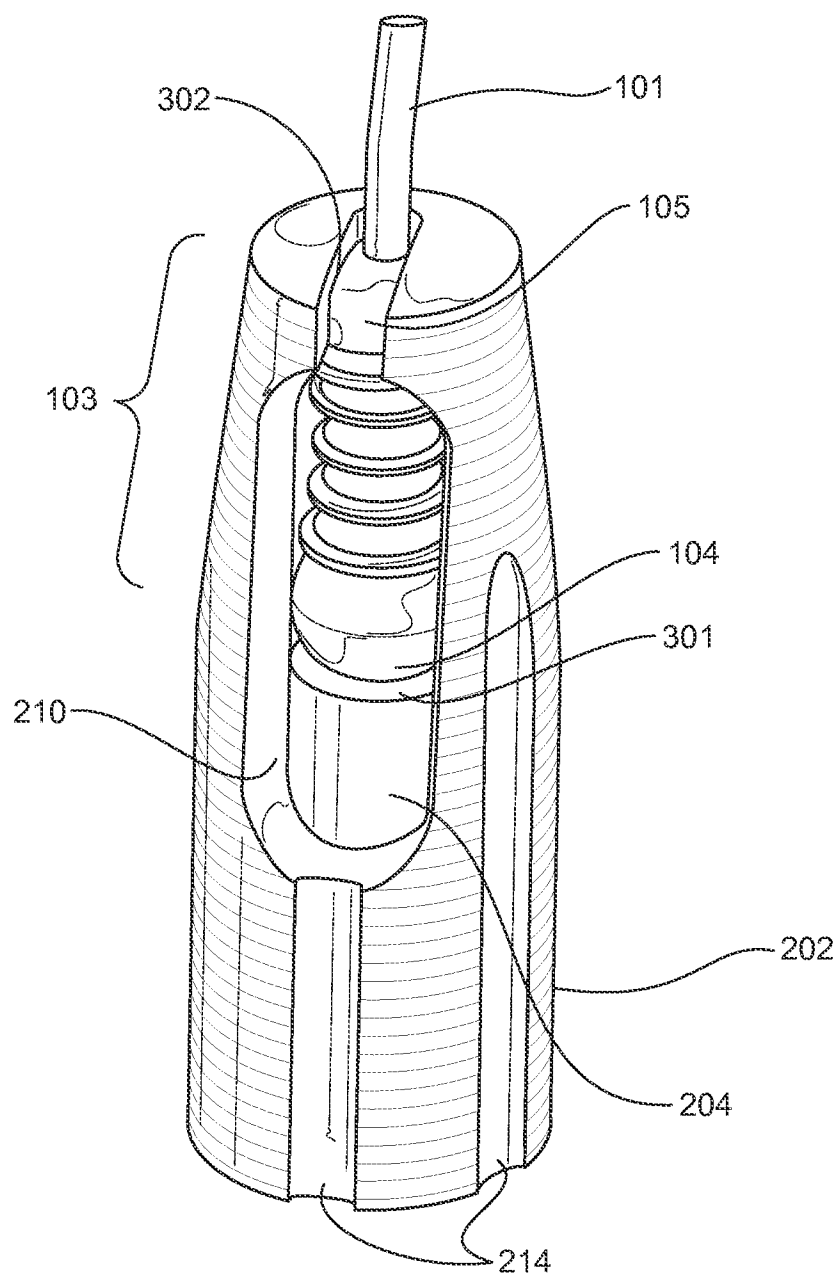




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**Fig. 4**



**Fig. 5**

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<b>DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63)</b>	Attorney Docket Number	LAR50-001
	First Named Inventor	Steven Larsen
	COMPLETE IF KNOWN	
	Application Number	
	Filing Date	
	Art Unit	
<input checked="" type="checkbox"/> Declaration Submitted With Initial Filing	OR	<input type="checkbox"/> Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)
Examiner Name		

I hereby declare that: (1) Each inventor's residence, mailing address, and citizenship are as stated below next to their name; and (2) I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention titled:

Endodontic Instrument

(Title of the invention)

the application of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) \_\_\_\_\_ as United States Application Number or PCT International

Application Number \_\_\_\_\_ and was amended on (MM/DD/YYYY) \_\_\_\_\_ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

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[Page 1 of 3]

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### Claim of Foreign Priority Benefits

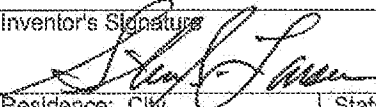
I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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**DECLARATION — Utility or Design Patent Application**

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<p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>							
<b>NAME OF SOLE OR FIRST INVENTOR:</b>				<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name (first and middle [if any])				Family Name or Surname			
Steven				Larsen			
Inventor's Signature 				Date			
				4-10-12			
Residence: City		State		Country		Citizenship	
No. Logan.		Utah		USA		USA	
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<input type="checkbox"/> Additional inventors or a legal representative are being named on the _____ supplemental sheet(s) PTO/SB/02A or 021.R attached hereto							

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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
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	Filing Date	
	First Named Inventor	Steven Larsen
	Title	Endodontic Instrument
	Art Unit	
	Examiner Name	
	Attorney Docket Number	LAR50-001

I hereby revoke all previous powers of attorney given in the above-identified application.

☐ A Power of Attorney is submitted herewith.

OR

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☒ Applicant/Inventor.

OR

☐ Assignee of record of the entire interest. See 37 CFR 3.71.

Statement under 37 CFR 3.73(b) (Form PTO/SB/95) submitted herewith or filed on \_\_\_\_\_

SIGNATURE of Applicant or Assignee of Record

Signature

Date

Name

Telephone

Title and Company

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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